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CLAIMS

What is claimed is:

1. A method for extracorporeal collection of blood components from a donor/patient, comprising:

flowing blood into a blood processing vessel;

separating platelets from said blood within said blood processing vessel;

collecting at least a portion of said platelets in a platelet collection reservoir separate from said blood processing vessel;

separating red blood cells from said blood within said blood processing vessel;

collecting at least a portion of said separated red blood cells in a red blood cell collection reservoir separate from said blood processing vessel, wherein said platelet separation and collection steps are completed separate from said red blood cell separation and collection steps.

2. A method as recited in Claim 1, wherein said platelet separation and collection steps are completed prior to said red blood cell separation and collection steps.

3. A method as recited in Claim 1, wherein prior to said red blood cell separation and collection steps, and separate from said platelet separation and collection steps, said method further comprises a red blood cell collection set-up phase including:

separating red blood cells from said blood within said blood processing vessel;

establishing an AC ratio in the blood processing vessel of between about 6 and 16 and a packing factor of at least about 11 within separated red blood cells within said blood processing vessel.

4. A method as recited in Claim 3, wherein said packing factor is established to be about 13, and wherein said AC ratio is established to be about 8.

5. A method as recited in Claim 3, said set-up phase further including:

flowing blood components out of said blood processing vessel, wherein substantially all of said blood components flowing out of the blood processing vessel are accumulated for infusion to a donor/patient.

6. A method as recited in Claim 3, further comprising:

removing said blood from a donor/patient through a single needle;

returning uncollected components of said blood to said donor/patient through said single needle.

7. A method as recited in Claim 6, wherein said removing and returning steps are alternately and repeatedly performed during corresponding blood processing and blood component return modes, respectively.

8. A method as recited in Claim 6, wherein during said platelet separation and collection steps, said method further comprises:

recirculating a portion of said uncollected blood components into said blood processing vessel; and,

wherein during said red blood cell separation and collection steps, said method includes:

returning substantially all of said uncollected blood components to said donor/patient.

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9. A method as recited in Claim 3, wherein said blood is flowed into said blood processing vessel at a flow rate, and said establishing step comprises:

reducing said flow rate.

10. A method as recited in Claim 3, wherein said blood processing vessel is rotated at an rpm rate, and wherein said establishing step comprises:

increasing said rpm rate.

11. A method as recited in Claim 3, said establishing step including:

maintaining a predetermined anticoagulant infusion rate to said donor/patient.

12. A method as recited in Claim 3, said establishing step including:

removing platelets and plasma together through a common port from said blood processing vessel.

13. A method as recited in Claim 1, wherein during said platelet separation and collection steps said method further comprises:

separating plasma from said blood within said blood processing vessel;

collecting at least a portion of said separated plasma in a plasma collection reservoir.

14. A method as recited in Claim 1, wherein during said red blood cell separation and collection steps said method further comprises:

separating plasma from said blood within said blood processing vessel;

collecting at least a portion of said separated plasma in a plasma collection reservoir.

15. A method as recited in Claim 1, further comprising:

adding a storage solution to said red blood cells collected in said red blood cell collection reservoir.

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16. A method as recited in Claim 15, wherein said storage solution is added through an assembly having a sterile barrier filter.

17. A method as recited in Claim 1, further comprising:

leukoreduction filtering of said red blood cells collected in said red blood cell collection reservoir.

18. A method for extracorporeal collection of blood components from a donor/patient comprising:

removing blood from a donor/patient through a single needle;

flowing said blood into a blood processing vessel;

separating platelets from said blood within said blood processing vessel;

collecting at least a portion of said platelets in a platelet collection reservoir separate from said blood processing vessel;

separating red blood cells from said blood within said blood processing vessel;

collecting at least a portion of said separated red blood cells in a red blood cell collection reservoir separate from said blood processing vessel, wherein said platelet separation and collection steps are completed separate from said red blood cell separation and collection steps;

returning uncollected blood components of said blood to said donor/patient through said single needle.

19. A method as recited in Claim 18, further comprising:

separating plasma from said blood within said blood processing vessel;

collecting at least a portion of said plasma in a plasma collection reservoir separate from said blood processing vessel, wherein said plasma separation and collection steps are completed at least partially contemporaneous with said platelet separation and collection steps.

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20. A method as recited in Claim 18, wherein prior to said red blood cell separation and collection steps, and separate from said platelet separation and collection steps, said method further comprises a red blood cell collection set-up phase including:

separating red blood cells from said blood within said blood processing vessel;

establishing a hematocrit of at least about 75% within said separated red blood cells within said blood processing vessel and an AC ratio within said blood at about 8.

21. A method as recited in Claim 20, further comprising:

maintaining said hematocrit and AC ratio during said red blood cell separation and collection steps.